LISTING OF CLAIMS:

1. (Original) A liquid ejection apparatus comprising:

a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion;

an ejection electrode provided on the liquid ejection head, to which a voltage is applied for generating an electric field to eject the droplet;

a voltage applying unit for applying the voltage to the ejection electrode;

a substrate including insulative material for receiving ejected droplets; and

an ejection atmosphere adjusting unit for keeping an atmosphere subject to ejection from the liquid ejection head, to a dew point of 9 degrees centigrade or more and less than a water saturation temperature.

2. (Original) A liquid ejection apparatus comprising:

a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion;

an ejection electrode provided on the liquid ejection head, to which a voltage is applied for generating an electric field to eject the droplet;

a voltage applying unit for applying the voltage to the ejection electrode; and

a substrate including insulative material having a surface resistance of 10^9 Ω/cm^2 or less at least at the area to receive ejected droplets.

3. (Original) A liquid ejection apparatus comprising:

a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion;

an ejection electrode provided on the liquid ejection head, to which a voltage is applied for generating an electric field to eject the droplet;

a voltage applying unit for applying the voltage to the ejection electrode; and

a substrate including insulative material provided with a surface treatment layer making a surface resistance 10^9 Ω/cm^2 or less at least at the area to receive ejected droplets.

4. (Original) A liquid ejection apparatus comprising:

a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion;

an ejection electrode provided on the liquid ejection head, to which a voltage is applied for generating an electric field to eject the droplet;

a voltage applying unit for applying the voltage to the ejection electrode; and

a substrate including insulative material provided with a surface treatment layer formed by coating of a surfactant at least at the area to receive ejected droplets.

5. (Original) A liquid ejection apparatus comprising:

a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion;

an ejection electrode provided on the liquid ejection head,

to which a voltage is applied for generating an electric field to eject the droplet; and

a voltage applying unit for applying the voltage of a signal waveform to the ejection electrode, a voltage value of the signal waveform at least partly satisfying V_S (V) of the following expression (A), where a maximum value of surface potentials of an insulative substrate that receives ejected droplets, is represented by V_{max} (V), and a minimum value of the same by V_{min} (V).

$$V_S \leq V_{mid} - V|_{max-min}|,\ V_{mid} + V|_{max-min}| \leq V_S \qquad (A)$$

Here, $V|_{max-min}|$ (V) is defined by the following equation (B), and V_{mid} V) by equation (C).

$$V|_{max-min}| = |V_{max-min}| \qquad (B)$$

$$V_{mid} = (V_{max} + V_{min})/2 \qquad (C)$$

6. (Original) A liquid ejection apparatus comprising:

a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion;

an ejection electrode provided on the liquid ejection head, to which a voltage is applied for generating an electric field to eject the droplet;

a detecting unit for detecting surface potentials of an insulative substrate that receives ejected droplets; and

a voltage applying unit for applying the voltage of a signal waveform, a voltage value of the signal waveform at least partly satisfying V_S (V) of the following expression (A), where a maximum value of surface potentials of an insulative substrate detected by the detecting unit, is represented by V_{max}(V), and a

minimum value of the same by V_{min} (V).

$$V_S \leq V_{mid} - V|_{max-min}|,\ V_{mid} + V|_{max-min}| \leq V_S \qquad (A)$$

Here, $V|_{max-min}|$ (V) is defined by the following equation (B), and V_{mid} V) by equation (C).

$$V|_{max-min}| = |V_{max-min}| \qquad (B)$$

$$V_{mid} = (V_{max} + V_{min})/2 \qquad (C)$$

7. (Currently amended) The liquid ejection apparatus of ~~claims 5 or 6~~ claim 5, wherein the signal waveform outputted by the voltage applying unit is a waveform maintaining a constant potential so as to satisfy V_S of aforementioned expression (A).

8. (Currently amended) The liquid ejection apparatus of ~~claims 5 or 6~~ claim 5, wherein the signal waveform outputted by the voltage applying unit is a pulse voltage waveform and at least either the maximum value or the minimum value of the pulse voltage satisfies V_S of aforementioned expression (A).

9. (Original) The liquid ejection apparatus of claim 8, wherein a condition that the maximum value of the pulse voltage applied by the voltage applying unit is larger than and the minimum value of the pulse voltage applied by the voltage applying unit is smaller than V_{mid} is satisfied.

10. (Currently amended) The liquid ejection apparatus of ~~claims 5 or 6~~ claim 5, wherein a condition that, out of a difference between the maximum value of the pulse voltage applied by the voltage applying unit and V_{mid}, and a difference between

V_{mid} and the minimum value of the pulse voltage applied by the voltage applying unit, one of the difference is larger than the other difference.

11. (Original) A liquid ejection apparatus comprising:

a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion;

an ejection electrode provided on the liquid ejection head, to which a voltage is applied for generating an electric field to eject the droplet;

a voltage applying unit for applying the voltage to the ejection electrode; and

a static eliminator arranged oppositely to an insulative substrate that receives ejected droplets, for discharging the insulative substrate.

12. (Original) The liquid ejection apparatus of claim 11, wherein the static eliminator is an electrode for discharging, arranged oppositely to the insulative substrate that receives the ejected droplets, and the apparatus further comprises an AC voltage applying unit to apply an AC voltage to the electrode for discharging.

13. (Original) The liquid ejection apparatus of claim 12, wherein the ejection electrode and the electrode for discharging are the same electrode.

14. (Currently amended) The liquid ejection apparatus of claim 11, wherein the static eliminator ~~is~~ comprises a corona discharge type static eliminator.

15. (Currently amended) The liquid ejection apparatus of claim 11, wherein the static eliminator ~~is~~ comprises a static eliminator which irradiates light to the insulative substrate to discharge the insulative substrate.

16. (Currently amended) The liquid ejection apparatus of ~~any one of claims 1 to 15~~ claim 1, wherein an inner diameter of the nozzle is 20 μm or less.

17. (Currently amended) The liquid ejection apparatus of claim 16, wherein the inner diameter of the nozzle is 8 μm or less.

18. (Currently amended) The liquid ejection apparatus of claim 17, wherein the inner diameter of the nozzle is 4 μm or less.

19. (Currently amended) A liquid ejection method of a liquid ejection apparatus including a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion, an ejection electrode provided on the liquid ejection head applied with a voltage for generating an electric field to eject the droplet, and a voltage applying unit for applying the voltage to the ejection electrode, comprising the step of:

ejecting the droplet toward a substrate including insulative material in an atmosphere which is kept to a dew point of 9 degrees centigrade or more and less than a water saturation temperature.

20. (Currently amended) A liquid ejection method of a liquid ejection apparatus including a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion, an ejection electrode provided on the liquid ejection head applied with a voltage for generating an electric field to eject the droplet, and a voltage applying unit for applying the voltage to the ejection electrode, comprising the step of:

ejecting the droplet toward a substrate including insulative material having a surface resistance of 10^9 Ω/cm2 or less at least at the area to receive ejected droplets.

21. (Currently amended) A liquid ejection method of a liquid ejection apparatus including a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion, an ejection electrode provided on the liquid ejection head applied with a voltage for generating an electric field to eject the droplet, and a voltage applying unit for applying the voltage to the ejection electrode, comprising the step of:
ejecting the droplet toward a substrate including insulative material provided with a surface treatment layer making a surface resistance 10^9 Ω/cm2 or less at least at the area to receive ejected droplets.

22. (Currently amended) A liquid ejection method of a liquid ejection apparatus including a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion, an ejection electrode provided on the liquid ejection head applied with a voltage for generating an electric field to eject the droplet, and a voltage applying unit for applying the voltage to the ejection electrode, comprising the step of:

ejecting the droplet toward a substrate including insulative material provided with a surface treatment layer formed by coating of a surfactant at least at the area to receive ejected droplets.

23. (Original) A liquid ejection method comprising the steps of:

forming a surface treatment layer on a substrate including insulative material, by coating a surfactant at least at the area to receive ejected droplets;

ejecting the droplets onto the surface treatment layer of the substrate from a tip of a nozzle, by applying an ejection voltage to solution inside the nozzle; and

removing the surface treatment layer except for portions which the droplets adhered, after the ejected droplets are dried and solidified.

24. (Currently amended) A liquid ejection method of a liquid ejection apparatus including a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion, an ejection electrode provided on the liquid ejection

head applied with a voltage for generating an electric field to eject the droplet, and a voltage applying unit for applying the voltage to the ejection electrode, comprising the step of:

applying the voltage of a signal waveform to the ejection electrode, a voltage value of the signal waveform at least partly satisfying V_s (V) of the following expression (A), where a maximum value of surface potentials of an insulative substrate that receives ejected droplets, is represented by V_{max} (V), and a minimum value of the same by V_{min} (V).

$$V_S \leq V_{mid} - V|_{max-min}|,\ V_{mid} + V|_{max-min}| \leq V_S \qquad (A)$$

Here, $V|_{max-min}|$ (V) is defined by the following equation (B), and V_{mid} V) by equation (C).

$$V|_{max-min}| = |V_{max-min}| \qquad (B)$$

$$V_{mid} = (V_{max} + V_{min})/2 \qquad (C)$$

25. (Original) The liquid ejection method of claim 24, further comprising the step of measuring the surface potentials of the insulative substrate before applying the voltage to the ejection electrode; and obtaining the maximum value V_{max} (V) and the minimum value V_{min} (V).

26. (Currently amended) The liquid ejection method of ~~claims 24 or 25~~ claim 24, wherein the signal waveform of the voltage applied to the ejection electrode maintains a constant potential that satisfies V_s of aforementioned expression (A).

27. (Currently amended) The liquid ejection method of ~~claims 24 or 25~~ claim 24, wherein the signal waveform of the voltage applied to the ejection electrode is a pulse voltage waveform and at least either the maximum value or the minimum value of the pulse voltage satisfies V_s of aforementioned expression (A).

28. (Original) The liquid ejection method of claim 27, wherein a condition that the maximum value of the pulse voltage is larger than V_{mid} and the minimum value is smaller than V_{mid} is satisfied.

29. (Currently amended) The liquid ejection method of ~~claims 27 or 28~~ claim 27, wherein, out of a difference between the maximum value of the pulse voltage and V_{mid}, and a difference between V_{mid} and the minimum value of the pulse voltage, one of the difference is larger than the other difference.

30. (Currently amended) A liquid ejection method of a liquid ejection apparatus including a liquid ejection head having a nozzle for ejecting a droplet of charged solution from a tip portion, an ejection electrode provided on the liquid ejection head, to which a voltage is applied for generating an electric field to eject the droplet, and a voltage applying unit for applying the voltage to the ejection electrode, comprising the step of:

discharging an insulative substrate before ejecting the droplet by application of ejecting voltage to the ejection

electrode.

31. (Original) The liquid ejection method of claim 30, wherein the discharging the insulative substrate is performed by applying an AC voltage to an electrode for discharging, the electrode arranged oppositely to the insulative substrate.

32. (Currently amended) The liquid ejection method of claim 31, wherein the electrode for discharging is the same ~~with~~ as the ejection electrode.

33. (Currently amended) The liquid ejection method of claim 30, wherein the discharging of the insulative substrate is performed by using a corona discharge type static eliminator.

34. (Currently amended) The liquid ejection method of claim 30, wherein the discharging of the insulative substrate is performed by using a static eliminator that irradiates light to the insulative substrate.

35. (Currently amended) The liquid ejection method of ~~any one of claims 19 to 34~~ claim 19, wherein diameter of an ejection opening of the nozzle is 20 μm or less.

36. (Currently amended) The liquid ejection method of claim 35, wherein the diameter of the ejection opening of the nozzle is 8 μm or less.

37. (Currently amended) The liquid ejection method of claim 35, wherein the diameter of the ejection opening of the nozzle is 4 μm or less.

38. (Currently amended) A method for forming a wiring pattern of a circuit board comprising the steps of:

employing the liquid ejection method according to ~~any one of claims 19 to 37~~ claim 19; and

ejecting droplets of metal paste onto the substrate.

39. (new) The liquid ejection apparatus of claim 6, wherein the signal waveform outputted by the voltage applying unit is a waveform maintaining a constant potential so as to satisfy V_S of aforementioned expression (A).

40. (new) The liquid ejection apparatus of claim 6, wherein the signal waveform outputted by the voltage applying unit is a pulse voltage waveform and at least either the maximum value or the minimum value of the pulse voltage satisfies V_S of aforementioned expression (A).

41. (new) The liquid ejection apparatus of claim 40, wherein a condition that the maximum value of the pulse voltage applied by the voltage applying unit is larger than and the minimum value of the pulse voltage applied by the voltage applying unit is smaller than V_{mid} is satisfied.

42. (new) The liquid ejection apparatus of claim 6, wherein a condition that, out of a difference between the maximum value of the pulse voltage applied by the voltage applying unit and V_{mid}, and a difference between V_{mid} and the minimum value of the pulse voltage applied by the voltage applying unit, one of the difference is larger than the other difference.

43. (new) The liquid ejection apparatus of claim 11, wherein an inner diameter of the nozzle is 20 μm or less.

44. (new) The liquid ejection apparatus of claim 43, wherein the inner diameter of the nozzle is 8 μm or less.

45. (new) The liquid ejection apparatus of claim 44, wherein the inner diameter of the nozzle is 8 μm or less.

46. (new) The liquid ejection method of claim 25, wherein the signal waveform of the voltage applied to the ejection electrode maintains a constant potential that satisfies V_s of aforementioned expression (A).

47. (new) The liquid ejection method of claim 24, wherein the signal waveform of the voltage applied to the ejection electrode is a pulse voltage waveform and at least either the maximum value or the minimum value of the pulse voltage satisfies V_s of aforementioned expression (A).

48. (new) The liquid ejection method of claim 47, wherein a condition that the maximum value of the pulse voltage is larger than V_{mid} and the minimum value is smaller than V_{mid} is satisfied.

49. (new) The liquid ejection method of claim 47, wherein, out of a difference between the maximum value of the pulse voltage and V_{mid}, and a difference between V_{mid} and the minimum value of the pulse voltage, one of the difference is larger than the other difference.

50. (new) The liquid ejection method of claim 48, wherein, out of a difference between the maximum value of the pulse voltage and V_{mid}, and a difference between V_{mid} and the minimum value of the pulse voltage, one of the difference is larger than the other difference.

51. (new) The liquid ejection method of claim 28, wherein, out of a difference between the maximum value of the pulse voltage and V_{mid}, and a difference between V_{mid} and the minimum value of the pulse voltage, one of the difference is larger than the other difference.

52. (new) The liquid ejection method of claim 30, wherein diameter of an ejection opening of the nozzle is 20 μm or less.

53. (new) The liquid ejection method of claim 52, wherein the diameter of the ejection opening of the nozzle is 8 μm or less.

54. (new) The liquid ejection method of claim 52, wherein the diameter of the ejection opening of the nozzle is 4 μm or less.

55. (new) A method for forming a wiring pattern of a circuit board comprising the steps of:

employing the liquid ejection method according to claim 30; and

ejecting droplets of metal paste onto the substrate.